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Did U.S. Agricultural Policy Lock Farmers into Wheat?

The Capitalization of Farm Policies into Land Prices in the U.S and Canada

by

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I. Introduction

The twentieth century witnessed a array of government farm policies in Canada and the U.S. To the extent that the programs benefitted farmers the return to government programs would be capitalized into land values. The reasoning is straightforward. Any program designed to make farming more profitable raises the demand for all inputs into the subsidized farming activities. Of these, the input that is most inelastically supplied to the farm sector, usually land, will gain the largest percentage price gain. Since land is a durable asset, any expectation that the support policies (or other profit increasing activities) will continue will raise the purchase price of land. The initial landowners, rather than workers or prospective farmers or landowners, will pocket a large share of the gains. Conversely, a large share of any reduction in support will be translated into capital losses for current landowners. The capitalization effect is well understood though difficult to measure.[1]

The main obstacle to measuring the overall effects of farm programs on farm land prices is the difficulty of finding a sample, a laboratory experiment, in which the variables fluctuating most are farm policy and farm land values. In the usual time series it is hard to separate policy influences on land values from the effects of changes in technology, weather, demand, and transportation. This paper presents tests from the appropriate kind of sample, one dominated by variation in farm land values and farm policy. We follow the history of a strip of contiguous crop reporting districts in upper North Dakota and southwestern Manitoba where farmers initially concentrated heavily on wheat production. It is a region of fairly homogeneous climate, soil, technology, labor supply and capital supply, divided by an international border. To the extent that tax policies are relatively constant, major movements in farm policies should drive movements in land values.

There are two possible reasons why we might not directly observe the capitalization effect in a ratio of land values from our sample: 1) Our approach assumes that crop mix on both sides of the border remains

1 See for example Schultze; Johnson (1984), pp. 25-28; Melichar (1979); Reinsel and Reinsal (1979); Doll and Widdows (1981); Melichar (1981); Castle and Hoch (1982); Scott (1983); Pope et al. (1979); Barry (1980) and Burt

the same throughout the period; and 2) farm policies on either side of the border could affect land values on the other side to the extent that either country can influence the world price. This is most likely to happen in response to U.S. agricultural policy with its emphasis on production controls through acreage restrictions. It is likely that these policies have an impact on world prices and that Canadian farmers could respond on two margins: intensive, i.e., higher yields and extensive, i.e., more acreage.

The paper is organized as follows. In Section II we chronicle Canadian and U. S. wheat policy since World War I followed by a discussion of our data and empirical methodology in Section III. In Section IV we present our empirical results followed by (Section V) the implications of our preliminary results and our directions for further research. In Section VI we outline the tasks for a research assistant. We offer a conclusion in Section VII.

II. Wheat Policy since World War I

In this section we survey the U. S. and Canadian government policies that may have caused international differences in the value of wheat-growing prairie land. We abstract from world-market influences that are likely to have had the same effect on wheat prices in both countries.

A. Canadian Wheat Policy[2]

Before the establishment of the Canadian Wheat Board as a monopsonist and monopolist in 1944, Canada did not directly intervene in the market for wheat, except during wartime and the depression years. On June 11, 1917, Canada established the Board of Grain Supervisors and gave it monopoly control of wheat. The Board was empowered to buy Canadian grain; to fix uniform national prices with regard to location, transportation costs, quality, and grade; and to resell grain to domestic millers and Allied purchasing agents (Fowke (1957) p. 169). Open market trading resumed on July 21, 1919 but closed again 10 days later to stem what was viewed as excessive speculative activity. On July 31, 1919 the Dominion government

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(1986).

[2] For our historical treatment of Canadian wheat policy we relied on Fowke and Wilson (1957). For a more

established the Canadian Wheat Board and vested in it the power to buy and sell the 1919 crop. This one-year stop-gap organization went out of operation in August 1920. Because it was temporary in both intent and fact, we doubt that landowners significantly capitalized its perceived benefits into land values.

The return to open market trading coincided with a sharp decline in the prices of wheat. Although there was no causal link between the cessation of the first Wheat Board and the wheat price drop, farmers argued strongly against free markets. They associated the high wartime and immediate postwar prices with monopoly marketing. As a result, farmers in the major wheat-producing provinces formed voluntary cooperatives to market their grain. The pools were organized in 1923 and 1924 and incorporated provincially. They operated in concert through a jointly owned Central Selling Agency that was incorporated in 1924 by the federal government. The pools marketed 37% of the 1924-25 crop and then slightly more than half the crop for the next five years. (Fowke (1957), p. 235). The motivation for the pools was a belief that speculators were reaping profits at the expense of producers. Particularly irksome to farmers was the fact that grain prices varied over the year. While the pools guaranteed farmers the same price throughout any season they could not suppress inter-seasonal price variation.[3] Hindsight, suggests that the pools did as well as could have been expected, though they could not bring back the peak prices of the war years.

The impact of the pools on land values depends on how firmly farmers believed pooling would solve intra- and inter-seasonal price variation and on whether they went through a bubble cycle in expecting a

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later discussion of the Canadian Wheat Board, see Schmitz and McCalla (1979) and McCalla and Schmitz (1979).

[3] Debate broke out between the pools and the Winnipeg Wheat Exchange over who paid farmers higher prices. The evidence that exists is inconclusive (Levine, (1987), pp. 60-62).

return to wartime values.[4] If they correctly perceived the pools as just a seasonal stabilizer, the net benefits would have been very small. As such we do not anticipate finding a measurable effect on farm values in the 1920s. Also small, we suspect, were the effects of the subsidization of credit through the Canadian Farm Loan Act of 1927.

The provincial pools went bankrupt in 1931. In 1929 the Central Selling Agency overestimated the final market price of wheat and as a result made initial payments to farmers that exceeded the final prices received. The Central Selling Agency remained afloat in 1929 thanks to a guarantee by the provincial government, and followed by a federate guarantee for the 1930 crop. With the federal guarantee came increased federal control of the Central Selling Agency. From 1931 to 1935, the Central Selling Agency sought to stabilize the price of wheat by purchasing wheat and holding it off the market. Though the amount of wheat accumulated by the federal government was significant, reaching 235 million bushels or practically the entire stock of Canadian wheat in marketable position in October 1934, the efforts were viewed as temporary (Fowke (1957), p. 259). The Dominion government coupled stabilization policies with an increased tariff on countries outside of the Commonwealth and British Empire. The tariff was relatively low at 6 cents a bushel but more importantly the tariff doomed stabilization because the British Empire and Commonwealth represented a wheat surplus area. As a result we doubt that the stabilization policies of the federally controlled Central Selling Agency affected land values in the early 1930s.

The government's role in wheat policy changed in 1935 with the establishment of the Canadian Wheat Board. Selling to the Board was a voluntary option for farmers to the open market. The Board

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[4] Levine (1987) believes that the psychological impact on farmers was important.

operated by setting a minimum price for wheat. If this price exceeded the eventual market price, the Treasury absorbed the difference between what the Canadian Wheat Board paid farmers and what the Board received for wheat on the market. If the established price was below the eventual selling price, a subsequent payment was made to farmers. The policy of the Board was to set prices close to expected market prices. Their goal was not to support prices but merely to stabilize fluctuations over the year.

Stabilization over the year was achieved by the policy of paying all farmers the same price regardless of the date of supply. From 1935 to 1943, the Wheat Board erred only twice in setting prices above the market,, but only in the 1938-39 crop year did the Board suffer a major loss. Overall, because the tariff did not protect Canadians from world price movements we expect that the voluntary wheat board from 1935 to 1943 did not yield benefits significant enough to be picked up by the data. Other policies contemporaneous with the voluntary wheat board may have increased the benefits to wheat farming. In 1939 the government initiated crop insurance through the Prairie Farm Assistance Act. The other deviation from prior policy was the use of marketing quotas in 1940 and acreage reduction in 1941 to limit the supply of wheat in the hope of boosting prices. Acreage reduction was continued for three years but restrictions were removed when wheat prices skyrocketed in the later War years. The quotas and acreage reduction schemes used during the early war years were seen as temporary measures and hence we do not expect that farmers capitalized the benefits. Nevertheless, they are important, because of the precedent they set. For most farmers the Prairie Farm Assistance Act did not yield benefits. Indeed, for our sample ream the program represents a tax. For the fifteen crop years 1939-40 to 1953-54, the farmers of Manitoba paid in almost thirteen million dollars and received back only about four million dollars (Fowke (1957), p. 293).

During World War II the Dominion government instituted two new policies which could have affected the returns to wheat farming: 1) the Farm Improvement Loans Act of 1944; and 2) the granting of monopsony power to the Canadian Wheat Board in 1943. The Farm Improvement Loans Act provided farmers with subsidized credit. The degree of credit of subsidy will determine the benefit and hence whether

we expect capitalization. The monopsony power granted to the Canadian Wheat Board on September 27, 1943 was conceived as temporary, expiring on July 31, 1945 (Fowke (1957), p. 275). However, the Canadian Wheat Board has maintained power to this day. Given that the Canadian Wheat Board for most years was involved in smoothing prices over the crop year rather than supporting prices, we do not expect it to have influenced land values to any appreciable amount.

The Wheat Board achieved permanence only in 1967 when it was made a Crown Corporation (Schmitz and McCalla (1979), p. 81). At issue for our study is when the benefits, if any, of a compulsory Wheat Board got capitalized by farmers. In particular when did it support prices directly or indirectly and when would such support have been foreseen by investors. From 1943 to 1973 the Wheat Board had set an initial price exceeding final market prices only in the crop year 1968-69. Before 1973, the Board used marketing quotas to restrict supply in order to raise prices. The extent to which this benefitted farmers depended on the elasticity of foreign demand for Canadian Wheat and thus on Canada's share of the world market. Until the mid-1950s Canada was the dominant world supplier (Schmitz and McCalla (1979), p. 83). Beginning in 1973 the Wheat Board established minimum and maximum prices for wheat. Whether this benefitted farmers depends on whether the constraint is binding. The official price floors set in 1973 were the only ones that the market did not come close to reaching, To this extent the pricing policy after 1973 could only have harmed farmers. However, when the policy was set no one could have forecast the high real and nominal wheat prices of the mid to late 1970s. Consequently, farmers may have expected benefits from the pricing policy and capitalized then into land values.

B. United States Wheat Policy[5]

The U. S. government first intervened directly in agricultural markets in World War I.[6] Like Canada,

[5] Our interpretation of U. S. wheat policy relies heavily on Benedict (1953), Cochrane and Ryan (1976), Hadwiger (1970) and Johnson (1984).

[6] Before World War I, farm legislation had dealt with the transportation, marketing and warehousing of

the U. S. government was concerned that wartime scarcity would make it more difficult to supply the government with enough wheat for its uses. The U. S. Food Administration Grain Corporation was created on August 14, 1917 under the powers of the Wartime Food and Fuel Act. Herbert Hoover assumed command of the Food Administration and stood ready to buy and sell wheat at an established "fair price". The "fair" price, determined by an independent committee of twelve men, was below what the freely determined market price would have been. The U. S. Food administration stopped its operations on May, 1919 but it was immediately succeeded by the U. S. Grain Corporation which functioned until May 31, 1920. Trading in futures on the Chicago Board of Trade resumed on July 15, 1920. In view of the temporary nature of the World War I programs, we hypothesize that they would have had no effect on land values in North Dakota.

The 1920s were turbulent times in agricultural markets, breeding attempts at stabilization.[7] Wheat prices plunged from $2.58 a bushel at the opening of futures trading in July 1920 to $0.92 a bushel in December 1921 (Genung (1954), pp. 10-11). The resulting agricultural distress prompted farmers to lobby for government intervention. Congress responded with the Grain Futures Act of 1921 and the Federal Warehouse Act of 1923. Neither is likely to have had a significant impact on the price of wheat. As in Canada, the U. S. government encouraged the development of monopolistic practices through the Cooperative Marketing Act of 1922. The cooperatives were aimed at bypassing the perceived monopoly power of the middlemen. Insufficient capital was also believed to be a partial cause of farm distress in the early twenties, leading to the Intermediate Credits Act of 1923. As it turned out, the cooperatives ran into financial

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agricultural commodities but not with the prices of output.

7 For an analysis of the temporal and spatial agricultural distress in the interwar years, see Alston (1983).

difficulties and the intermediate credit banks were little used, suggesting that they were no more efficient than the middlemen they were designed to replace.

Congress passed some potentially revolutionary agricultural bills in 1927 and 1928, together known as McNary-Haugen Plan. These bills, would have divorced the export price, or world price, from the higher domestic supported price, but President Coolidge vetoed both bills.

While campaigning for the Presidency in 1928, President Hoover pledged to assist agriculture. After he was elected, Hoover succeeded in passing the Agricultural Marketing Act of 1929, which created the Federal Farm Board. The Farm Board was endowed with $500 million and offered loans to co-operatives accepting wheat as collateral. The loans supported wheat prices whenever the price of wheat was such that selling wheat on the market was less profitable than not repaying the loan. The Farm Board was able to moderate the price decline of wheat until June 1931 when it had exhausted its funds. Benedict (1953, p. 265) estimates that the price support policies of the Farm Board increased the return to U. S. wheat farmers by $80 to $100 million. But, this greatly overstates the net gain to wheat farmers, by overlooking the possibly equal price depressing affect of the subsequent disposal of all the board's stocks. Though on balance farmers did not gain from the activities of the board, they may have expected benefits especially given Hoover's reputation as an able planner.

After the abandonment of price supports in June 1931, no federal policy departures relevant to the price of wheat or wheat land came until the New Deal.[8] With Roosevelt's New Deal, U. S. agricultural policy entered a new era. Major policy changes came with the Agricultural Act of May 12, 1933. The Act consisted of three parts: Title I, the Agricultural Adjustment Act; Title II, the Emergency Farm Credit Act; and Title III, giving the President the power to act to inflate the currency. Titles I and II might have propped up farm land

[8] Beginning in early 1933 numerous states imposed farm foreclosure moratoria which prevented creditors from foreclosing (Alston, (1984)). North Dakota passed a moratorium which undoubtedly benefitted some wheat farmers but these benefits were small compared too those from the programs of the federal government which occurred simultaneously. In our empirical section we may be overestimating the benefits from federal programs by our inability to control for the impact of the moratorium in North Dakota.

values significantly, though Hadwiger (1970, p. 120) argues that the initial AAA was perceived as temporary.

Through the Emergency Farm Credit Act and its successor the Farm Credit Act of 1933, the government refinanced farm mortgages held by lenders other than federal land banks, reduced interest rates retroactively on farm mortgages, a pursued a general policy of not foreclosing. The Farm Credit Administration brought a massive infusion of subsidized credit into the farm sector in the early New Deal years and appears to have been a most important contribution in preventing farm failures (Rucker and Alston, 1987).

The Agricultural Adjustment Act (AAA) was a major departure from previous agricultural policy. Its wheat program supported farm income directly by paying participating farmers for reducing acreage (rental payments) and making additional payments based on the percentage of wheat consumed domestically. Farmers who signed up for the AAA program received $0.28/bushel in 1933, $0.29/bushel in 1934 and $0.33/bushel in 1935 on 54 percent of their production (Hadwiger, p. 130). The combined payments amounted to about one-third of the total income of wheat farmers in those three years. The AAA programs also aided the incomes of farmers indirectly through the effect of reduced acreage on wheat prices,. Following the introduction of the wheat program, wheat prices more than doubled between the 1933-34 crop and December 1935. Nourse, Davis and Black (1937) attributed the price rise more to drought, rather than the AAA. For our purposes, however, the important question is what wheat farmers thought was the cause of better prices. They enthusiastically supported the AAA wheat program -89 percent of the wheat farmers in 1933 in the Dakotas, Kansas, and Montana signed up for the initial program in 1933 (Benedict (1953), p. 312). Most likely the support was predicated on both the direct and perceived indirect benefits of the wheat program. Unless perceived as temporary, we expect that large benefits were capitalized into wheat land prices in the early New Deal years.

The AAA was declared unconstitutional in 1935 but was succeeded by the Soil Conservation and

Domestic Allotment Act of 1936. The act bypassed the serious constitutional problems of the AAA while retaining its substance. The 1936 bill was viewed at the time as no more than a stop-gap measure (Hadwiger (1970) p. 130). With the end of the drought in the wheat regions, it was realized that surpluses would arise. As such, there was a consensus (at least within the USDA) that commodity programs should be permanent (Hadwiger (1970) p. 137-8). The Agricultural Adjustment Act of 1938 was designed to curb production more effectively. Compulsory production controls were imposed if approved by two-thirds of the farmers. Participating farmers received nonrecourse commodity loans using wheat as collateral. The loan rate set a price floor for wheat. Farmers continued to receive conservation payments (rentals) and when appropriated in the yearly budget, farmers received supplemental parity payments. In addition crop insurance was made available beginning in 1939. It appears likely that farmers would have capitalized the perceived benefits of the 1938 Agricultural Adjustment Act to the extent that participants in the political debate viewed the measure as permanent rather than an emergency relief program.[9] Moreover, farmers had five years of experience with government action, and by 1938 farmers believed that government could and would intervene in their behalf. In addition the ex-post record indicates that the 1938 Act payed significant benefits beginning in 1939. Market prices held at support levels and farmers received parity and conservation payments representing over a quarter of their income (Hadwiger, (1970), pp. 154, 162).

Policymakers sent conflicting signals about wheat prices and land values during World War II. Their continuing concern for farm incomes yielded high wheat price supports, of 90 percent of parity starting in October 1942, with a guarantee to last until two years after the war (Rockoff (1984), Cochrane and Ryan (1976, p. 135). Meanwhile, starting from 1941, the USDA and the state agricultural extension services

9 To the extent that Canadians also viewed the 1938 act as permanent, they too would have capitalized any perceived benefits at the same time as U.S. farmers. This will compound the difficulties in assessing the capitalization of benefits.

mounted a campaign to educate farmers about the disastrous consequences that had followed the farm-land bubble in the wake of World War I. We hypothesize that the impact of government policy on real U. S. wheat prices and farm land values in 1943-48 should have been positive, but less positive than for 1938-42.

Postwar Congressional debate over farm supports led to a brief defeat for farmers, followed by a lasting victory. A compromised bill in 1948 cut the level of generosity. However, before the provisions of the bill took effect, a new bill was in the works in response to the Democrats' winning the Presidency and control of both houses in 1948. The new Agricultural Act of 1949 was a lasting victory for higher price supports. Setting aside possible gyrations of expectations within 1948, we hypothesize a more positive effect of the 1949 bill on wheat prices and land values than the effect implied by previous policies. With only minor changes wheat policy remained substantively the same from 1949 through 1964. The primary means of price support were non-recourse loans and purchase agreements, along with production controls beginning in 1953. We shall treat the whole period 1949-64 as a single policy regime, with land values in upper North Dakota affected by the real support price of wheat.

The Food and Agriculture Act of 1965 marked an important shift in direction for farm income supports. Price supports were lowered, allowing more play to the market price. Incomes were supported more through direct payments generous to induce voluntary acreage reduction. Except for a slow upward drift in support prices over the next 18 years, policy was only slightly changed by legislation in 1970, 1973, and 1978.

The farm crisis of the 1980s evoked much more generous government support. The level of support was raised most by the announcement of the Payment in Kind program in January 1983. In the first year alone, USDA stabilization outlays rose from $6 billion to $19 billion, partly because the crisis worsened and partly because the new support was so generous. While the 1985 and 1986 farm bills removed many of the mechanisms of PIK, they matched its generosity. We will not discuss the relatively momentous changes in wheat policy in the 1990s because our data set only allows us to measure land values up to 1983.

As a step toward converting the historical sketch and the statistical transformations into a form suitable for policy analysis, Table 1 lists the policy shifts we consider to have potentially been the most significant influences on U. S. and Canadian land prices. This list is not to imply that policy in one of the two countries did not affect wheat prices of land values in the other country. In many instances, such international influences did occur (McCalla and Josling (1985)). For example, U. S. acreage restrictions probably did raise wheat prices and land values in Canada, though we expect less than in the United States.

Table 1

Likely Effects of Major Policy Changes on U.S. and Canadian Farm Land Values

Policy	**Likely Timing and Direction of effects on US/Canadian land value ratio**
Canadian Central Selling Agency	No appreciable impact
Canadian Wheat Board	No appreciable impact
U. S. Agricultural Adjustment Act, 1933	No appreciable impact, 1934-37
U. S. Agricultural Adjustment Act, 1938	Raise the ratio, 1939-41
U. S. Agriculture Act of 1949	Raise the ratio, 1949-64
U. S. Food and Agriculture of 1965	Raise value of ratio relative to 1949-64
U. S. Payment in Kind Program	Raise ratio, 1983

Note: All effects are relative to the free-market no-intervention case, not to alternative policies.

Section III: Data

Our sampling region is a contiguous group of crop reporting districts in North Dakota and Manitoba for the years 1921-1983 (see Figure 1)[10]. For North Dakota we selected crop reporting district 2. For Manitoba we selected crop reporting district 1. The regions appear fairly homogeneous in longitudinal

position, size, precipitation, and emphasis on wheat. From the districts described above, we constructed time series of land values for North Dakota, ND, and Manitoba, MAN, for the years 1921 to 1984 using data from the Agricultural Census of the United States and Statistics Canada. ND and MAN are graphed together in Figure 2. The series move together for the entire period under examination and the series do not appear to deviate until sometime in the 1950s.

We then tested ND and MAN for a unit root using the Augmented Dickey-Fuller (ADF) test to determine whether shocks had a permanent or temporary effect on each land price series. The ADF test can be written as follows:

$$\Delta y_t = \beta_0 + (\rho - 1)\, y_{t-1} + \gamma t + \sum_{1=1}^{l} \delta_i \,(y_{t-i} - y_{t-i-1}) + \varepsilon_t \qquad (1)$$

where t is a time trend, l is the lagged truncation parameter (i.e. the number of lagged differences used to correct for serially correlated errors), and $\{ e_t \}$ is a serially independent error term. The number of lagged differences included in the equation is determined using the Perron general-to-specific criteria (Perron, 1989). We begin estimation with four lagged differences of the dependent variable. The lag truncation parameter is sequentially reduced by one until the t-statistic on the last lagged difference was greater than 1.6. The null hypothesis that r is equal to one is then tested against the alternative that r is less than one. The t-test to determine if r is significantly different from one is presented in Table 2. The null hypothesis that ND and MAN contain a unit root can not be rejected at the 5 or 10 percent levels of significance.

[10] Following 1983 the U.S. changed crop reporting districts in a manner such that we can not extend our series.

Table 2
Augmented Dickey-Fuller Test for Land Prices

Series	Coefficient (r -1)	T-stat	(Lags)
MAN	-0.037 (.030)	-1.211	1
ND	-0.056 (.028)	-1.985	0

Number of Observations = 62

The Dickey-Fuller 2.5% and 1% critical values for a sample of 50 observations are -3.22 and -2.93. ** denotes significance at the 5% level.

Although the null hypothesis of a unit root can not be rejected for the two land price series, it is possible that a linear combination of ND and MAN is a stationary time series process. To allow for this possibility, we tested the two series for cointegration using the Johansen Maximum Likelihood procedure. A lag length of one was chosen for the test on the basis of the Schwarz Information Criteria. The empirical results appear in Table 3 and indicate that the null hypothesis of no cointegration can be rejected at the 10 percent level of significance for the $?_{MAX}$ test and at the 5 percent level for the $?_{TRACE}$ test. Box-Ljung and Lagrange Multiplier tests did not indicate the presence of autocorrelation in the residuals.

We then normalized the cointegrating vector with respect to Manitoba land prices. This yielded the long-run equilibrium relationship MAN - .962ND = 0. The restriction of (1, -1) is then imposed on the cointegrating vector to determine whether the long-run forecast of land price differences, MAN - ND, tends to zero as the forecasting horizon tends to infinity. The resulting likelihood ratio test statistic, 0.43, indicates that the restriction can not be rejected at the 5 or 10 percent levels of significance.

Table 3

Johansen Maximum Likelihood Tests for Cointegration

Null Hypothesis	Alternative Hypothesis	Test Statistic
$?_{MAX}$ tests		
r = 0	r = 1	12.25*
$?_{TRACE}$ tests		
r = 0	r > 0	17.83**
Long-run Equilibrium Relationship		MAN - 0.962ND = 0

*denotes significance at the 10 percent level
**denotes significance at the 5 percent level

Section V: Interpretation and Directions for Future Work

Our initial finding of cointegration has important implications for the effects of government farm policies on land values in Manitoba and North Dakota. This is counter to our initial expectations, but we will offer an ex-post explanation for our econometric results that in turn offer a direction for our future research efforts. Canadian land values may not have departed from U.S. land prices for two reasons: 1) Canadian farmers who continued to plant wheat benefitted from U.S. wheat policy; and 2) Canadian farmers were able to substitute into other crops, which, on the margin, proved to be as profitable as wheat. We believe that both forces were operating but our preliminary findings suggest that the effect from substitution into other crops dominated the return from planting wheat, especially in the period 1950-1983. Before presenting some evidence, we will explain the two effects.

To the extent that U.S. farm policy influences world prices, Canadian farmers who continue to plant wheat profit from our wheat policy in several ways: they receive higher prices; they can intensify their production in response to the higher prices, capturing more inframarginal rents; or they can expand acreage into more marginal areas. This implies that the lack of movement of the ratio of land prices comes about not

because policies are not capitalized but they are capitalized on both sides of the border. The mechanism is as follows. In the U.S. farmers receive an increased (support) price of wheat but on fewer acres. But, farmers in the U.S. (in certain periods) also received checks from the government for cutting back on acreage. The evidence is clear that incomes went up in the U.S: at times as much as one-third of income came from government payments. For Canadian farmers, to the extent that the reduction in acreage in the U.S. propped up world wheat prices, their income would increase because they were not forced (in most periods) to cut back on acreage. As a result Canadian farm incomes may have risen with U.S. incomes when the U.S. forced cutbacks in wheat production in return for rental payments though the increase in income in Canada should not be as great as the income in the U.S. Our future research will address this issue by measuring acreage reductions in the U.S., intensification of production in both countries as measured by increased yields, and (possible) acreage increases in Canada.

A complementary explanation for the stability in land prices is that on the U.S. side of the border wheat policy "locked" farmers into growing wheat but on the Canadian side, policy gave farmers an incentive to search for more profitable crops to substitute for some wheat production. Evidence consistent with this explanation would be a relative decline in Canada in wheat production compared to the U.S.
Our preliminary evidence follows in Table 4.[11]

[11] The data for the U.S. side still has to be put into a form that is comparable to Canada. As a result the interpretation in the text is somewhat speculative.

Table 4

Ratio of Cash Crops to Total Cash Crop Acreage

Year	Wheat		Barley		Flax		Rapeseed (Canola)	
	U. S.	Canada	U. S.	Canada	U. S.	Canada	U. S.	Canada
1940	98.5	78.5	1.0	20.9	0.5	0.5		
1945	52.9	56.8	35.7	37.8	11.4	5.4		
1950	65.1	66.3	11.9	23.3	23.0	10.3		
1955	92.7	41.1	3.8	38.7	3.4	20.2		
1960	96.3	59.1	3.1	18.3	0.5	22.6		
1965	64.2	67.3	25.8	6.0	10.0	26.7		
1970	75.6	34.1	24.4	32.7		33.1		
1974*	81.6	42.9	18.4	32.8		18.6		25.1
1979 **	73.8	51.6	26.3	19.4		15.9		22.9

Notes: Denominator includes only wheat, barley, flax and rapeseed, i.e., the major cash crops on both sides of the border.
*Includes acres for the production of rapeseed. Includes rapeseed acreage from Crop Reporting districts 1, 2, and 7-10.
**Includes acres for the production of rapeseed. Includes rapeseed acreage from Crop Reporting districts 1, 2, and 3.

If we look at the ratio of wheat to total acreage over time in our sample areas we find the following: Prior to U.S. New Deal policy the prices on both sides of the border remain relatively constant with farmers on both sides of the border specializing in wheat. For the New Deal years we find that both countries remain in wheat. To this extent we would expect a slight movement in U.S. land values relative to Canada given that U.S. farmers received some direct payments. The degree of divergence would depend on the perceived permanency of U.S. agricultural support. Before we could reach firm conclusions on expected permanency Canada and the U.S. entered WWII. During World War II farmers on both sides of the border initially remained specialized in wheat and profited from high wartime world wheat prices, though by the end of War Canada had begun to diversify. Following WWII, the acreage patterns of Canadian and U.S. farmers begin to diverge. Over the 1950s U.S. farmers remain concentrated in wheat while the Canadian farmers begin to diversify. In the 1950s the production of flax in our Canadian sample regions expanded tremendously while it

remained relatively constant in the U.S. regions. Flax produced linseeds whose oil was an ingrediant in paint. The paint industry boomed in the immediate post war period as a result of home and commercial building construction. Commensurate with the boom in the building industry, flax prices skyrocketed.

In the 1960s the "new" crop for Canadian farmers was rapeseed. Rapeseed is better known as canola. As we can see from the table, acreage in rapeseed increased dramatically in Canada in the 1960s and 1970s but not in the U.S. Following the freedom to farm act in the U.S., farmers in the U.S. also shift into canola suggesting that, on the margin, canola was as profitable as wheat. What do we make of this preliminary evidence? Our evidence on the stability of land prices coupled with acreage diversification in Canada suggests that U.S. wheat policy sufficiently rewarded U.S. farmers to keep them growing wheat but that there were alternative crops that could have been grown without the support of taxpayers' money that would have been just as profitable to North Dakota farmers as remaining in wheat. In short, the wheat program in North Dakota was a waste of tax dollars.

VII: Conclusion

We provide a historical narrative of agricultural policies affecting wheat land in the U.S. and Canada. We next test for the impact of government land policies on the price of land. To do so, we examine the relationship between land prices on the Manitoba and North Dakota border for the years 1921-1983. We use neighboring districts to control for the effects of weather, climate, and other geographic variables that affect land values. Our expectation was that innovations in North Dakota land prices would primarily reflect the capitalization of government farm policies into land values. To our initial surprise the empirical analysis indicates that prices in North Dakota and Manitoba are insignificantly different from one another. An explanation for our results is the possibility that U.S. farm policies increased both U.S. and Canadian land values to the same degree and/or that Canadian farmers found that producing flax and canola was equally profitable to the subsized wheat produced in the U.S. The implication that Canadian farmers found equally profitable alternative crops implies that for the region that we studied the wheat program was not simply

redistribution from taxpayers to farmers but a waste of taxpayer dollars because North Dakota farmers would have been just as well off growing other crops rather than remaining locked into wheat production.

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Figure 1
North Dakota and Manitoba Land Prices 1921 - 1983